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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/848,869	GU ET AL.	
	Examiner	Art Unit	
	Bai D. Vu	2165	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2008 and 22 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant has amended claims 9-10 and 15-17, and added new claim 21 in the amendment filed on 4/22/2009.

Claims 1-11 and 13-21 are pending in this office action.

Response to Arguments

2. Applicant's arguments filed on 9/21/2008 and 4/22/2009 with respect to claims 1-11 and 13-21 have been considered but are moot in view of the new ground(s) of rejection.

Regarding to the applicant's argument:

- Applicant asserted, on page 12 of the Remarks that the specification as amended on 11/23/2007 provides a written description for the limitation in claim 9, under 35 U.S.C. § 112 first paragraph.

In response to applicant's argument, examiner acknowledges the amended specification filed on 11/23/2007 as taken in view of the MPEP 2163.06 (III). Therefore the rejection of claim 9 under 35 U.S.C. § 112 first paragraph is withdrawn.

- Applicant asserted, on pages 13-17 of the Remarks that the examiner did not cite, by column number and line number, any text in either of the two cited references by Agarwal et al. (US Pat. No. 7,080,081 B2) in view of Machado et al. (US Pat. No. 5,517,631) against the added limitations in claims 1, 11, 13 and 15-17; and provide any response to applicant's arguments in the amendments filed on 7/14/2008 and 9/21/2008. Accordingly, the next office action is respectfully requested to be made non-final.

In response to applicant's argument, examiner respectfully explains that in the last office action filed on 12/22/2008, on top of page 3 stated "*examiner will fully reconsider the claimed amendments filed on 09/21/2008 after the clarification of the 35 U.S.C. § 112, first paragraph rejection is considered in the reply to this office action*". Therefore, this non-final office action responses to the amendments filed on 9/21/2008 and 4/22/2009 after the applicant's clarification of the 35 U.S.C. § 112, first paragraph is acknowledged.

- Applicant asserted, on pages 13-15 of the Remarks that Agarwal et al. and Machado et al. do not disclose the limitations recited in independent claims 1 and 13.

In response to applicant's argument, examiner respectfully disagrees and maintains the rejections as clearly discussed below in this office action. Moreover, the rejection of independent claims 15-17 under 35 U.S.C. § 103 as being obvious over the teaching of Agarwal et al., in view of Machado et al. and

further in view of Duvillier et al. (US Pub. No. 2002/0103815 A1) is hereby maintained.

- Applicant asserted, on pages 15-16 of the Remarks that examiner did not provide any additional response to applicants' arguments for claims 2, 3, 8, 10, 11 and 19.

  In response to applicant's argument, examiner respectfully rejects claims 2, 3, 8 and 10 with the same prior arts but in new mapping; and claims 11 and 19 as being moot in view of the new ground(s) of rejection.

3. For the following rejections, applicant is reminded that the examiner is entitled to the broadest reasonable interpretation of the claims. The Applicants always have the opportunity to amend the claims during prosecution and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater 162 USPQ 541,550-51 (CCPA 1969). Therefore, the aforementioned assertion is moot.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1-5, 7, 8, 13, 14 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. (US Pat. No. 7,080,081 B2) in view of Machado et al. (US Pat. No. 5,517,631).

As per **claim 1**, Agarwal et al. discloses **a method implemented in a computer, the method comprising:**

generating an array update operation based on a query to update a relational database; wherein said array update operation specifies a plurality of row-identifier and value pairs to update multiple rows in a table of said relational database; as (see e.g., col. 2 lines 39-48).

repeatedly finding, and storing in a structure, a block-identifier of a block that contains a row of data identified by a row-identifier in at least a group of row-identifier and value pairs in said plurality, by use of a database index prior to retrieval of the block as the data structure (see e.g., FIG. 5; col. 2 lines 42-45; and col. 7 lines 13-35); the records interpreted as a group of row-identifier and value pairs (col. 2 lines 46-48); and explains obtaining list of block identifiers prior to retrieving the blocks and updating a relational database (col. 4 line 64 to col. 5 line 16).

wherein said structure is located in main memory of said computer; as (see e.g., FIG. 1; and col. 3 line 39 to col. 4 line 21).

wherein each value comprises data to be updated in said row identified by said row-identifier; as (see e.g., col. 6 lines 43-50).

performing a single access operation without context witching, to access retrieve from a storage device and store in a cache, a number of blocks of data of said table, said blocks being identified by block-identifiers in the structure; (as scanning blocks of the table for records (see e.g., col. 2 lines 39-48); a buffer manager 205 interpreted as cache (see e.g., FIG. 2; and *col. 5 lines 11-18)*; and the data structure (see e.g., FIG. 5; col. 2 lines 42-45; and col. 7 lines 13-35); however, may not be specific to the feature of performing a single access operation without context witching).

wherein several of said blocks are non-contiguous in said storage device; and as (see e.g., FIG. 8; and col. 9 lines 12-32).

repeatedly updating, in blocks in the cache, each row identified in the group of row-identifier and value pairs, using a corresponding value in the row-identifier and value pairs as cited herein Insert, Delete, Purge, and Update functions (see e.g., FIG. 8; and col. 11 line 4 to col. 12 line 55).

However, Machado et al. discloses **performing a single access operation without context witching** which is not explicitly disclosed by Agarwal et al. as a single sequence both data read and data write operation to and from the disk surface and a buffer memory (see e.g., col. 5 lines 33-40)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Machado et al. teaching of automatic data block sequencing with dual function opcodes for reading and writing data blocks in real time into Agarwal et al. system in order to provide a data sequencer for a disk drive

employing zoned data recording having data fields split into segments by intervening embedded servo sectors and wherein the data sequencer provides for automatic sequencing of data blocks during writing data to, and reading data from, the split data fields (Machado et al., col. 3 line 63 to col. 4 line 1).

As per **claim 2**, Agarwal et al. discloses **the method of claim 1 further comprising:**

sorting the block-identifiers, prior to retrieval of the blocks as blocks are numbered according to the logical order interpreted as sorting the block-identifiers (see e.g., FIG. 3; col. 5 lines 60-62; and col. 6 lines 10-13).

However, Machado et al. discloses **performing the single access operation** which is not explicitly disclosed by Agarwal et al. as a single sequence both data read and data write operation to and from the disk surface and a buffer memory (see e.g., col. 5 lines 33-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Machado et al. teaching of automatic data block sequencing with dual function opcodes for reading and writing data blocks in real time into Agarwal et al. system in order to provide a data sequencer for a disk drive employing zoned data recording having data fields split into segments by intervening embedded servo sectors and wherein the data sequencer provides for automatic sequencing of data blocks during writing data to, and reading data from, the split data fields (Machado et al., col. 3 line 63 to col. 4 line 1).

As per **claim 3**, Agarwal et al. discloses **the method of claim 2 wherein: the sorting is performed subsequent to storage of the block-identifiers in the structure** as blocks are numbered according to the logical order in the data structures in FIGS. 3-5 (see e.g., FIGS. 3-5 and 8; col. 2 lines 42-48; col. 5 lines 60-62; and col. 6 lines 10-13).

As per **claim 4**, Agarwal et al. discloses **a method of claim 1 further comprising: subsequent to said finding and prior to said storing, checking if the block identifier has a duplicate already stored in the structure and if so then not storing the block identifier in the structure** as (see e.g., col. 8 line 62 to col. 9 line 2).

As per **claim 5**, Agarwal et al. discloses **the method of claim 1 further comprising, prior to updating: repeating said finding of block-identifiers for all row-identifiers in the group of row-identifier and value pairs** as (see e.g., col. 2 lines 42-45).

As per **claim 7**, Agarwal et al. discloses **the method of claim 1 wherein: the database index is a B-tree index** as (see e.g., col. 5 lines 16-22).

As per **claim 8**, Agarwal et al. discloses **the method of claim 1 wherein: said structure comprises an array; and the array has a number of entries identical to the number of blocks that can be held in the cache** as (see e.g., FIG. 5).

As per **claim 13**, Agarwal et al. discloses **a non-volatile media in which are stored instructions to perform a method comprising:**

generating an array update operation based on a query to update a relational database; wherein said array update operation specifies a plurality of row-identifier and value pairs to update multiple rows in a table of said relational database; as (see e.g., col. 2 lines 39-48).

repeatedly finding, and storing in a structure, a block-identifier of a block that contains a row identified by a row-identifier in at least a group of row-identifier and value pairs in said plurality, by use of a database index of a relational database as the data structure (see e.g., FIG. 5; col. 2 lines 42-45; and col. 7 lines 13-35); the records interpreted as a group of row-identifier and value pairs (col. 2 lines 46-48); and explains obtaining list of block identifiers prior to retrieving the blocks and updating a relational database (col. 4 line 64 to col. 5 line 16).

performing a vector read operation without context witching during said performing, to retrieve from a storage device and store in a cache, a number of blocks, said blocks being identified by block-identifiers in the structure; and (as scanning blocks of the table for records (see e.g., col. 2 lines 39-48); a buffer manager 205 interpreted as cache (see e.g., FIG. 2; and col. 5 lines 11-18); and the data

structure (see e.g., FIG. 5; col. 2 lines 42-45; and col. 7 lines 13-35); however, may not be specific to the feature of performing a vector read operation without context witching).

repeatedly updating, in blocks in the buffer cache, each row identified in the group of row-identifier and value pairs, using a corresponding value in the row-identifier and value pairs; as cited herein *Insert, Delete, Purge, and Update functions (col. 11 line 4 to col. 12 line 55).*

wherein several of said blocks are non-contiguous in said storage device as (see e.g., FIG. 8; and col. 9 lines 12-32).

Agarwal et al. does not explicitly disclose **performing a vector read operation without context witching**. However, Machado et al. discloses as a single sequence both data read and data write operation to and from the disk surface and a buffer memory (see e.g., col. 5 lines 33-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Machado et al. teaching of automatic data block sequencing with dual function opcodes for reading and writing data blocks in real time into Agarwal et al. system in order to provide a data sequencer for a disk drive employing zoned data recording having data fields split into segments by intervening embedded servo sectors and wherein the data sequencer provides for automatic sequencing of data blocks during writing data to, and reading data from, the split data fields (Machado et al., col. 3 line 63 to col. 4 line 1).

As per **claim 14**, Agarwal et al. discloses **a non-volatile media of claim 13 being further encoded with said structure storing the block-identifiers** as (see e.g., col. 10 lines 4-6).

As per **claim 18**, Agarwal et al. discloses **a non-volatile media of claim 13 being comprised in at least one of a disk, a chip and cartridge** as (see e.g., col. 4 lines 22-42).

6. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. in view of Machado et al., and further in view of Vagnozzi (US Pat. No. 6,070,164).

As per **claim 6**, Agarwal et al. discloses **the method of claim 1 wherein: the database index is a hash index and the table is organized in a hash cluster; and** as (see e.g., col. 2 lines 4-9).

Agarwal et al. and Machado et al. do not explicitly disclose **during said finding, a single directory is used to obtain the block identifier**. However, Vagnozzi discloses as explains storing all the records in a single file (see e.g., FIG. 1; and col. 4 lines 24-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Vagnozzi teaching of single file directory into the Agarwal et al. and Machado et al. systems in order to provide very fast query response and fast update response time (Vagnozzi, col. 3 lines 1-2).

7. **Claims 9 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. in view of Machado et al., and further in view of Debrunner (US Pat. No. 6,321,234 B1).

As per **claim 9**, Agarwal et al. and Machado et al. do not explicitly disclose **the method of claim 1 further comprising: writing a plurality of logs, at least one log for each row identified in the group of row-identifier and value pairs**. However, Debrunner discloses as log records to a transaction log (see e.g., col. 3 lines 22-24; and col. 7 lines 50-58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Debrunner teaching of process of logging transactions into Agarwal et al. and Machado et al. systems in order to preserve database throughput by reducing the contention which occurs for logging resources, even when such a system is scaled up with multiple database engines (Debrunner, col. 3 lines 7-10).

As per **claim 10**, Agarwal et al. and Machado et al. do not explicitly disclose **the method of claim 9 further comprising, during said write operation: unpinning each block after updating all rows in said each block; and flushing an unpinned block to disk only when another block needs space in the cache occupied by the unpinned block**. However, Debrunner discloses as (see e.g., col. 13 lines 53-67 and col. 14 lines 33-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Debrunner teaching of process of logging transactions into Agarwal et al. and Machado et al. systems in order to preserve database throughput by reducing the contention which occurs for logging resources, even when such a system is scaled up with multiple database engines (Debrunner, col. 3 lines 7-10).

8. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. in view of Machado et al., and further in view of Matsumani et al. (US Pat. No. 5,619,690 A).

As per **claim 11**, Agarwal et al. discloses **the method of claim 1 wherein a plurality of file offsets are provided to the single access operation, one file offset for each block in the group;** (as (see e.g., col. 9 lines 40-51); however, my not be specific to the single access operation).

However, Machado et al. and Matsumani et al. disclose the limitations which are not explicitly disclosed by Agarwal et al. as the followings:

Machado et al. discloses **the single access operation** which is not explicitly disclosed by Agarwal et al. as a single sequence both data read and data write operation to and from the disk surface and a buffer memory (see e.g., col. 5 lines 33-40).

Matsumani et al. discloses **wherein each file offset is an offset in a file from where reading of data is to begin** as (see e.g., FIG. 7; and col. 9 lines 26-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Machado et al. teaching of automatic data block sequencing with dual function opcodes for reading and writing data blocks in real time into Agarwal et al. system in order to provide a data sequencer for a disk drive employing zoned data recording having data fields split into segments by intervening embedded servo sectors and wherein the data sequencer provides for automatic sequencing of data blocks during writing data to, and reading data from, the split data fields (Machado et al., col. 3 line 63 to col. 4 line 1). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Matsumani et al. teaching of techniques of file placement optimization in the secondary storage system into Agarwal et al. and Machado et al. systems in order to provide a computer system which can accomplish optimum placement of files in a secondary storage system without setting the parameters of the secondary storage system in a host computer (Matsumani et al., col. 3 lines 34-38).

9. **Claims 15-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. in view of Machado et al., and further in view of Duvillier et al. (US Pub. No. 2002/0103815 A1).

As per **claim 15**, Agarwal et al. discloses **a computer comprising a processor and a memory coupled to the processor, the memory being encoded with instructions to:**

automatically generate an array update operation based on a query to update a relational database; as (see e.g., col. 2 lines 39-48).

automatically use a database index to look up a block identifier of a block that contains a row identified by an identifier in a plurality of identifier and value pairs to be used to perform said array update operation on a table in said relational database as (see e.g., col. 2 lines 42-45).

automatically store the block identifier in a structure in memory as the data structure (see e.g., FIGS 3-5);

automatically repeat instructions to said automatically use and said automatically store, for all identifiers in at least a group of identifier and value pairs in said plurality; as the records interpreted as a group of row-identifier and value pairs (see e.g., col. 2 lines 46-48).

automatically perform a vector read, to retrieve from a disk and store in a cache, each block in a group of blocks identified by block-identifiers stored in said structure, wherein the group of blocks are all stored in the cache during execution of a single function call; (as scanning blocks of the table for records (see e.g., col. 2 lines 39-48); a buffer manager 205 interpreted as cache (see e.g., FIG. 2; and *col. 5 lines 11-18)*; and the data structure (see e.g., FIG. 5; col. 2 lines 42-45; and col. 7 lines 13-35); however, may not be specific to the feature of execution of a single function call).

automatically modify a row in a block stored in the cache, using a value in the plurality of identifier and value pairs; automatically repeat instructions to said

automatically modify with each row identified in the group of identifier and value pairs (as (see e.g., col. 6 lines 33-38); however, may not be specific to modifying a row stored in the cache).

However, Machado et al. and Duvillier et al. disclose the limitations which are not explicitly disclosed by Agarwal et al. as the followings:

Machado et al. discloses **data stored in the cache during execution of a single function call** as a single sequence both data read and data write operation to and from the disk surface and a buffer memory (see e.g., col. 5 lines 33-40).

Duvillier et al. discloses **modifying a row stored in the cache** as object updated or modified storing in a disk page buffer in the data server cache (see e.g., ¶ 0140 lines 1-6) wherein the object interpreted as a row.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Machado et al. teaching of automatic data block sequencing with dual function opcodes for reading and writing data blocks in real time into Agarwal et al. system in order to provide a data sequencer for a disk drive employing zoned data recording having data fields split into segments by intervening embedded servo sectors and wherein the data sequencer provides for automatic sequencing of data blocks during writing data to, and reading data from, the split data fields (Machado et al., col. 3 line 63 to col. 4 line 1). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Duvillier et al. teaching of a technique for improving performance of information storage and retrieval systems into Agarwal et al. and Machado et al. systems in order to utilize

logical addresses for mapping object locations and physical addresses of objects stored within the data structures of the system (Duvillier et al., ¶ 0053 lines 8-10).

As per **claim 16**, Agarwal et al. discloses **an apparatus comprising a database, the apparatus comprising:**

means for generating an array update operation based on a query to update the database; wherein said array update operation specifies a plurality of row-identifier and value pairs to update multiple rows in a table of the database; as (see e.g., col. 2 lines 39-48).

means for using a database index to look up a block identifier of a block that contains the row identified by an identifier in the plurality of identifier and value pairs; as a query using information from either the individual block indexes or the composite index to obtain a list of block identifier, and scanning blocks of the table for records (col. 2 lines 42-45).

means for storing the block-identifier in a structure in memory; as the data structure (see e.g., FIGS 3-5).

means for repeating (using the database index to look up and storing the block-identifier) for all identifiers in at least a group of identifier and value pairs; as a query scanning the entire table for records and using a record-based index to find records (col. 2 lines 46-48) wherein the records interpreted as a group of row-identifier and value pairs.

means for performing a vector read, to store in a cache, each block in a group of blocks identified by block-identifiers stored in said structure, wherein the group of blocks are all stored in the cache during execution of a single function call (as scanning blocks of the table for records (see e.g., col. 2 lines 39-48); a buffer manager 205 interpreted as cache (see e.g., FIG. 2; and *col. 5 lines 11-18)*; and the data structure (see e.g., FIG. 5; col. 2 lines 42-45; and col. 7 lines 13-35); however, may not be specific to the feature of execution of a single function call).

means for modifying a row in a block stored in the cache, using a value in the plurality of identifier and value pairs; and means for repeating said modifying with each row identified in the group of identifier and value pairs (as (see e.g., col. 6 lines 33-38); however, may not be specific to modifying a row stored in the cache).

However, Machado et al. and Duvillier et al. disclose the limitations which are not explicitly disclosed by Agarwal et al. as the followings:

Machado et al. discloses **data stored in the cache during execution of a single function call** as a single sequence both data read and data write operation to and from the disk surface and a buffer memory (see e.g., col. 5 lines 33-40).

Duvillier et al. discloses **modifying a row stored in the cache** as object updated or modified storing in a disk page buffer in the data server cache (see e.g., ¶ 0140 lines 1-6) wherein the object interpreted as a row.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Machado et al. teaching of automatic data block sequencing with dual function opcodes for reading and writing data blocks in real time

into Agarwal et al. system in order to provide a data sequencer for a disk drive employing zoned data recording having data fields split into segments by intervening embedded servo sectors and wherein the data sequencer provides for automatic sequencing of data blocks during writing data to, and reading data from, the split data fields (Machado et al., col. 3 line 63 to col. 4 line 1). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Duvillier et al. teaching of a technique for improving performance of information storage and retrieval systems into Agarwal et al. and Machado et al. systems in order to utilize logical addresses for mapping object locations and physical addresses of objects stored within the data structures of the system (Duvillier et al., ¶ 0053 lines 8-10).

As per **claim 17**, Agarwal et al. discloses **a method implemented in a computer, the method comprising:**

generating an array update operation based on a query to update a database; wherein said array update operation specifies a plurality of row-identifier and value pairs to update multiple rows in a table of said database; as (see e.g., col. 2 lines 39-48).

finding a block-identifier of a block that contains the row identified by a row-identifier in a row-identifier and value pair in said plurality, by use of a database index in said database; as (see e.g., col. 2 lines 42-45).

storing the block-identifier in a structure in memory; as the data structure (see e.g., FIGS 3-5).

repeating (finding the block-identifier and storing the block-identifier), for all row-identifiers in at least a group of row-identifier and value pairs in said plurality; as a query scanning the entire table for records and using a record-based index to find records (col. 2 lines 46-48) wherein the records interpreted as a group of row-identifier and value pairs.

performing a vector read operation, to store in a buffer cache, each block in a group of blocks identified by block-identifiers stored in said structure, wherein the group of blocks are all stored in the cache during execution of a single function call (as scanning blocks of the table for records (see e.g., col. 2 lines 39-48); a buffer manager 205 interpreted as cache (see e.g., FIG. 2; and *col. 5 lines 11-18)*; and the data structure (see e.g., FIG. 5; col. 2 lines 42-45; and col. 7 lines 13-35); however, may not be specific to the feature of execution of a single function call).

updating the row in the block in the cache, using the value in the row-identifier and value pair; and repeating said updating with each row identified in the group of row-identifier and value pairs (as (see e.g., col. 6 lines 33-38); however, may not be specific to updating the row in the block in the cache).

However, Machado et al. and Duvillier et al. disclose the limitations which are not explicitly disclosed by Agarwal et al. as the followings:

Machado et al. discloses **data stored in the cache during execution of a single function call** as a single sequence both data read and data write operation to and from the disk surface and a buffer memory (see e.g., col. 5 lines 33-40).

Duvillier et al. discloses **updating the row in the block in the cache** as object updated or modified storing in a disk page buffer in the data server cache (see e.g., ¶ 0140 lines 1-6) wherein the object interpreted as a row.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Machado et al. teaching of automatic data block sequencing with dual function opcodes for reading and writing data blocks in real time into Agarwal et al. system in order to provide a data sequencer for a disk drive employing zoned data recording having data fields split into segments by intervening embedded servo sectors and wherein the data sequencer provides for automatic sequencing of data blocks during writing data to, and reading data from, the split data fields (Machado et al., col. 3 line 63 to col. 4 line 1). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Duvillier et al. teaching of a technique for improving performance of information storage and retrieval systems into Agarwal et al. and Machado et al. systems in order to utilize logical addresses for mapping object locations and physical addresses of objects stored within the data structures of the system (Duvillier et al., ¶ 0053 lines 8-10).

10. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. in view of Machado et al., and further in view of Gold (US Pub. No. 2002/0116573 A1).

As per **claim 19**, Agarwal et al. and Machado et al. do not explicitly disclose **the method of claim 2 wherein: the blocks are sorted during said sorting based on adjacency such that during performance of said single access operation, block-identifiers of blocks physically adjacent to one another at a periphery of a disk in the storage device are presented at one time to the storage device and identifiers of blocks that are physically adjacent to one another and located closer to a center of the disk are presented at another time.**

However, Gold discloses as (see e.g., FIG. 1; ¶ 0028 and ¶ 0031).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Gold teaching of data reading and data protection into the Agarwal et al. and Machado et al. systems in order to sorting a list of files into an order which reduces the movement of the reader relative to the medium for the reading of said files and reading the files from the medium in said order (Gold, ¶ 0008 lines 4-7).

11. **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. in view of Machado et al., in view of Duvillier et al., and further in view of Gold.

As per **claim 20**, Agarwal et al., Machado et al. and Duvillier et al. do not explicitly disclose **the computer of claim 15 wherein: the blocks are sorted during said single function call based on adjacency such that block-identifiers of blocks physically adjacent to one another at a periphery of said disk are presented at one time to a disk drive comprising said disk and identifiers of blocks that are**

physically adjacent to one another and located closer to a center of said disk are presented at another time.

However, Gold discloses as (see e.g., FIG. 1; ¶ 0028 and ¶ 0031).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Gold teaching of data reading and data protection into the Agarwal et al., Machado et al. and Duvillier et al. systems in order to sorting a list of files into an order which reduces the movement of the reader relative to the medium for the reading of said files and reading the files from the medium in said order (Gold, ¶ 0008 lines 4-7).

12. **Claim 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. in view of Machado et al., in view of Debrunner, and further in view of Robinson et al. (US Pat. No. 6,032,219 A)

As per **claim 21**, Agarwal et al., Machado et al. and Debrunner do not explicitly disclose **the method of claim 9 further comprising: performing a write operation from said cache to said storage device when space is needed in said cache**.

However, Robinson et al. discloses as flushing to make room for additional data (see col. 4 lines 42-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Robinson et al. teaching of buffering data into Agarwal et al., Machado et al. and Debrunner systems in order to have the need exists for a

system having the benefits of cache buffering without the necessity for multiple buffers (Robinson et al., col. 2 lines 26-38).

Conclusion

13. The following prior art made of record on form PTO-892 and not relied upon is cited to establish the level of skill in the applicant's art and those arts considered reasonably pertinent to applicant's disclosure. See MPEP 707.059(c).

Tzelnic et al. US- 5,948,062 A

14. The examiner requests, in response to this Office Action, support is shown for language added to any original claims on amendment and any new claims. That is, indicate support for newly added claim language by specifically pointing to page(s) and line number(s) in the specification and/or drawing figure(s). This will assist the examiner in prosecuting the application.

When responding to this Office Action, applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present, in view of the state of the art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections See 37 CFR 1.111(c).

Contact Information

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bai D. Vu whose telephone number is 571-270-1751. The examiner can normally be reached on Mon - Fri 8:30 - 6:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Neveen Abel-Jalil can be reached on 571-272-4074. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. D. V./
Examiner, Art Unit 2165
7/20/2009

/Neveen Abel-Jalil/
Supervisory Patent Examiner, Art Unit 2165